



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/843,808	04/30/2001	Eric Coupart	109420	9962
25944	7590	12/17/2003	EXAMINER	
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			CUEVAS, PEDRO J	
			ART UNIT	PAPER NUMBER
			2834	

DATE MAILED: 12/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/843,808	Applicant(s) COUPART ET AL. W	
	Examiner Pedro J. Cuevas	Art Unit 2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on August 5, and September 12, 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 13-44 is/are rejected.
- 7) ☒ Claim(s) 9-12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
 a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>6/03</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see page 9, filed August 5, 2003, with respect to the rejection(s) of claim(s) 1-42 under 35 U.S.C. § 102 and § 103 have been fully considered and are persuasive.

Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of U.S. Patent No. 3,806,744 to Abraham et al.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 1 and 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,144,132 to Nashiki in view of U.S. Patent No. 3,806,744 to Abraham et al.

Nashiki clearly teaches the construction of a permanent magnet motor comprising:

a flux-concentrating rotor comprising permanent magnets (7) disposed between pole pieces;

a stator (SCA) comprising teeth (S1A – S6A) having a free end deprived of pole swellings; and

a concentrated winding.

However, it fails to disclose non-magnetically interconnected pole pieces.

Abraham et al. teach the construction of a high frequency stepper motor comprising a non-magnetic rotor for the purpose of providing a multi-phase motor (Abstract).

It would have been obvious to one skilled in the art at the time the invention was made to use the non-magnetic rotor disclosed by Abraham et al. on the permanent magnet motor disclosed by Nashiki for the purpose of providing a multi-phase motor (Abstract).

4. With regards to claim 36, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use aluminum as the non-magnetic material, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

5. With regards to claims 37 and 38, it would have been obvious to one having ordinary skill in the art at the time the invention was made to exchange the position of the stator and rotor, since it has been held that rearranging parts of an invention involves only routine skill in the art. In re Japikse, 86 USPQ 70.

6. Claims 2-38, 15-22, 25, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,144,132 to Nashiki in view of U.S. Patent No. 3,806,744 to Abraham et al. as applied to claim 1 and 36-38 above, further in view of U.S. Patent No. 6,335,582 to Abukawa et al.

Nashiki in view of Abraham et al. disclose the construction of a permanent magnet motor as described above.

Abukawa et al. disclose a rotary electric machine wherein:

the pole pieces and the magnets are configured so as to minimize the difference $L_d - L_q$ where L_d is inductance on a forward axis and L_q is inductance on a quadrature axis (Figure 3);

the teeth are of non-constant width, increasing in width with increasing distance from the rotor starting from a determined distance from their free ends (Figure 2);

the stator having n_{teeth} teeth, the rotor having n_{pairs} pairs of poles, and the current having n_{phases} phases, wherein the number of teeth n_{teeth} satisfies $n_{\text{teeth}} = n_{\text{pairs}} * n_{\text{phases}}$ (Figure 6);

the stator has individual coils each removably disposed on one tooth (Figure 6);

the stator has at least one individual coil comprising a plurality of superposed turns of a substantially flat bundle of insulated wires wound around a winding axis, the cross-section of the bundle having a long dimension that extends substantially perpendicularly to the winding axis (Abukawa et al. – Figure 6);

the wires are of circular section (Abukawa et al. – Figure 6);

an inside section of the coil perpendicular to the winding axis is substantially rectangular (Figure 6);

an inside section of the coil perpendicular to the winding axis is larger on one side than on the other, and the stator comprises a tooth presenting a complementary profile (Figure 6);

the coil has, perpendicular to the winding axis, an inside section longer than an axial dimension of the tooth on which the coil is engaged, and a detector suitable for delivering a signal representative of rotation of the rotor being engaged in a gap formed between an inside face of the coil and a face of the tooth (Figure 6); and

constitutes a synchronous motor.

It would have been obvious to one skilled in the art at the time the invention was made to use the stator disclosed by Abukawa et al. on the dynamoelectric machine disclosed by Nashiki for the purpose of providing a permanent magnet rotating machine with large motor torque and high generating voltage.

7. Claims 4-8, 13-14, 25, and 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,144,132 to Nashiki in view of U.S. Patent No. 3,806,744 to Abraham et al. as applied to claim 1 and 36-38 above, further in view of U.S. Patent No. 4,618,792 to Yates.

Nashiki in view of Abraham et al. disclose the construction of a permanent magnet motor as described above.

Yates disclose a rotary electric machine wherein:

- the magnets are wedge-shaped when observed along an axis of rotation of the rotor, of width that tapers going away from the axis of rotation of the rotor (Figure 1);

- the pole pieces have cutouts and are engaged via said cutouts on splines on a shaft of the rotor (Figure 1);

- the splines are formed integrally with a central portion of the shaft (Figure 1);

- the pole pieces have radially inner edges and gaps are left between said radially inner edges and the shaft (Figure 1);

- each pole piece has, on a side facing towards the stator, a face that is non-circular around an axis of rotation of the rotor and convex towards the stator (Figure 1);

magnets have edges that are adjacent to the stator and the rotor has at least one at one axial end, a cheek-plate of non-magnetic material, with a periphery of the cheek-plate being set back from said edges (Figure 1);

the magnetic circuit of the stator comprises an assembly of sectors defining air-gaps intersecting the teeth at half width (Figure 1);

the sectors have co-operating portions in relief on docking sides;

the magnetic circuit inserted by force into a cylindrical case.

It would have been obvious to one skilled in the art at the time the invention was made to use the rotor disclosed by Yates on the dynamoelectric machine disclosed by Nashiki in view of Abraham et al. for the purpose of providing a permanent magnet rotating machine with large motor torque and high generating voltage.

8. With regards to claim 6, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form the splines integrally with a central portion of the shaft, since it has been held that forming in one piece an article, which has formerly been formed in two pieces and put together, involves only routine skill in the art. *Howard v. Detroit Stove Works*, 150 U.S. 164 (1893). The term "integral" is sufficiently broad to embrace constructions united by such means as fastening and welding. *In re Hotte*, 177 USPQ 326, 328 (CCPA 1973).

9. With regards to claim 7, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the splines and the central portion of the shaft of a non-magnetic material, in particular of aluminum, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

10. With regards to claims 16, 17, and 20, it would have been obvious to one having ordinary skill in the art at the time the invention was made to arrange the rotor to rotate in the range of 1,000 to 10,000 rpm and it's outside dimension in the radial direction lying in the range of 50 mm to 1 m, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

11. With regards to claim 20, it would have been obvious to one having ordinary skill in the art at the time the invention was made to select the wires having a diameter lying in the range 0.3 mm to 2.5 mm, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

12. Claims 23-24 and 39-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,144,132 to Nashiki in view of U.S. Patent No. 3,806,744 to Abraham et al., in view of U.S. Patent No. 6,335,582 to Abukawa et al. as applied to claims 2-38, 15-22, 25, and 35 above, and further in view of U.S. Patent No. 4,618,792 to Yates.

Nashiki in view of Abraham et al. in view of Abukawa et al. disclose the construction of a permanent magnet motor as described above.

Yates disclose a rotary electric machine wherein:

the wires are curved to form hooks at the electrical connection ends of the coil (Figure 1); and

the hooks are directed towards a midplane of the coil, perpendicular to the winding axis (Figure 1);

It would have been obvious to one skilled in the art at the time the invention was made to use the rotor disclosed by Yates on the dynamoelectric machine disclosed by Nashiki in view of Abraham et al. in view of Abukawa et al. for the purpose of providing a permanent magnet rotating machine with large motor torque and high generating voltage.

13. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,144,132 to Nashiki in view of U.S. Patent No. 3,806,744 to Abraham et al., in view of U.S. Patent No. 6,335,582 to Abukawa et al. further in view of U.S. Patent No. 4,618,792 to Yates, as applied to claims 23-24 above, further in view of U.S. Patent No. 4,896,839 to Curtis, Jr. et al.

Nashiki in view of Abraham et al. in view of Abukawa et al. in view of Yates disclose the construction of a dynamoelectric machine as described above.

However, it fails to disclose a dynamoelectric machine wherein the connection ends are soldered to locally stripped portions of sheathed electric cables.

Curtis, Jr. et al. teach the use of an apparatus and method for winding a strip of material into an arcuate elongated passage by forming connection ends (Figure 3), which are soldered to locally stripped portions of sheathed electric cables, for the purpose of providing a toroidal electrical transformer with continuous windings and a continuous wound core.

It would have been obvious to one skilled in the art at the time the invention was made to use the wires and winding method disclosed by Curtis, Jr. et al. on the dynamoelectric machine disclosed by Nashiki in view of Abraham et al. in view of Abukawa et al. in view of Yates for the purpose of providing a toroidal electrical dynamoelectric machine with continuous windings and a continuous wound core.

14. Claims 26-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,144,132 to Nashiki in view of U.S. Patent No. 3,806,744 to Abraham et al., in view of U.S. Patent No. 6,335,582 to Abukawa et al. further in view of U.S. Patent No. 4,618,792 to Yates, as applied to claims 23-24 above, further in view of U.S. Patent No. 4,688,951 to Guers.

Nashiki in view of Abraham et al. in view of Abukawa et al. in view of Yates disclose the construction of a dynamoelectric machine as described above.

However, it fails to disclose a dynamoelectric machine having:

at least one detector comprising a magnetic field sensor mounted on the stator in such a manner as to detect the magnetic field of the magnets of the rotor from a location that overlaps a peripheral region of the rotor when the machine is observed on the axis of rotation of the rotor;

for n-phase AC, the machine having n detectors mounted on consecutive teeth close to an opening in a case of the machine;

wherein the detector(s) is/are fixed to the magnetic circuit of the stator so as to extend along the radial axis of a tooth and the or each detector includes not only a magnetic field sensor, but also a temperature sensor.

Guers teach the construction of a roller bearing with contactless transmission of electric signals having magnetic field and temperature sensors (8 and 23) for the purpose of providing contactless transmission of electric signals between the roller bearing and the electric circuits.

It would have been obvious to one skilled in the art at the time the invention was made to use the sensor arrangement disclosed by Guers on the dynamoelectric machine disclosed by Nashiki in view of Abraham et al. in view of Abukawa et al. in view of Yates for the purpose of

providing contactless transmission of electric signals between the different parts of the dynamoelectric machine.

Allowable Subject Matter

15. Claims 9-12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

16. The following is a statement of reasons for the indication of allowable subject matter.

The prior art does not teaches the construction of a dynamoelectric machine according to claim 5, wherein as stated by claim 9:

the cross section of each spline presents a profile having opposite sides with inclined portions at an angle α to a radius passing through the middle of the spline, said angle being selected in such a manner as to make it possible for said splines to be made out of a material having weaker shear strength than the material used for making the pole pieces.

17. Claims 10-12 are considered allowable by their dependence on claim 9.

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTO-892.

19. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pedro J. Cuevas whose telephone number is (703) 308-4904. The examiner can normally be reached on M-F from 8:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor R. Ramirez can be reached on (703) 308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3432 for regular communications and (703) 305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Pedro J. Cuevas
December 11, 2003


BURTON S. MULLINS
PRIMARY EXAMINER